CLAIMS

1. A method of treating sleep disordered breathing comprising the step of electrical stimulation of nerves to increase muscle tone of upper airway muscles.

2. A method as claimed in claim 1 whereby the afferent nerves are stimulated.

3. The method of claim 2 whereby the site of electrical stimulation is within or adjacent to the genioglossus muscle.

4. The method of claim 2 whereby the site of electrical stimulation is in the vicinity of the hypoglossal motor nucleus or excitatory afferent nerve pathways leading to this structure.

5. The method of claim 1 whereby the electrical stimulation comprises trains of electrical pulses.

6. The method of claim 5 whereby the train length is approximately 10-30 pulses.

7. A method of treating sleep disordered breathing comprising the step of mechanical stimulation of nerves to increase muscle tone of upper airway muscles.

8. The method of claim 7 whereby mechanical stimulation is performed by a piezo electric mechanical element implanted at a site in the vicinity of the upper airway.

9. The method of claim 8 whereby the piezo-electric mechanical element is implanted within or adjacent to the base of the genioglossus muscle.

10. The method of claim 7 whereby the mechanical stimulation is periodic.

11. The method of claim 10 whereby the period is in the order of several seconds of vibration.

12. The method of claim 7 whereby the mechanical vibration occurs at frequencies in the range of 10-50 Hz.

13. The method of claim 1 or 7 whereby stimulation is repeated in accordance with the detected state of the airway.

14. The method of claim 1 or 7 whereby stimulation is carried out in accordance with a model of Cheyne-Stokes Respiration.

15. Apparatus for treating respiratory disorders comprising a piezo-electric mechanical element, adapted for implant within or adjacent the base of genioglossus muscle and a controller, adapted to elicit vibration of the element via an electrical signal.

16. A method of detecting respiratory disorders comprising the step of measuring a transthoracic impedance changes via implanted electrodes.

17. The method of claim 16 whereby a first electrode is placed in the left sub-pectoral region.

18. The method of claim 16 whereby a second electrode is placed in the right sub-pectoral region.

19. The method of claim 16 whereby the transthoracic impedance is measured by emitting high frequency electrical pulses.

20. The method of claim 19 whereby the frequency of the pulses is high compared to typical respiration or heart rate.

21. The method of claim 19 whereby the frequency of the pulses is approximately 20 Hz.

22. The method of claim 19 whereby the pulses are of approximately 1mA amplitude.

23. The method of claim 19 whereby the pulses are of approximately 15 microsecond duration.

24. The method of claim 19 whereby an impedance signal is compared to a baseline reference.

25. The method of claim 24 whereby the baseline reference is continuously updated.

26. The method of claim 24 whereby the signal having rhythmic variations at a rate of between approximately 6 and 25 per minute is taken as being indicative of normal respiration.

27. The method of claim 24 whereby the signal having a marked reduction in amplitude compared to the reference is taken as being indicative of an obstructive apnea.

28. The method of claim 24 whereby the signal having a first derivative of near zero is taken as being indicative of central apnea.

29. The method of claim 24 whereby the signal having a crescendo-decrescendo pattern with a period of approximately 40 to 120 seconds is taken as being indicative of Cheyne-Stokes Respiration.

30. A method of distinguishing open and closed airway apneic events are distinguished by a combination of implanted electrodes and acoustic transducers.

31. A method of treating respiratory disorders as shown and illustrated in Fig. 1